HIGHER EDUCATION

MONTHLY PUBLICATION OF THE U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education, Higher Education Division

VOL. XII, NO. 4 WASHINGTON, D. C. DECEMBER 1955

Soviet Secondary Education— Designed to Achieve Future Scientific Supremacy

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THE SOVIET educational system has for a number of years been oriented toward the training of scientists, engineers, technicians, and skilled laborers. A significant part of this educational system is the secondary school program which has been exerting an important influence on the substance and quality of higher education and of technical and vocational training. As a result of changes in policy regarding Soviet secondary education during the past 2 years, the emphasis on the sciences and on technical fields has become even stronger.

Soviets Concentrate on Science

The curriculum of the 10-year school—the Soviet equivalent for the American 12-year program—has since the mid-1930's required an average of about 40 percent of the total school hours for the study of the sciences. For the remaining hours, 6 percent has been devoted to physical education, and 54 percent to the social sciences and humanities. In addition to this already heavy concentration on science, the Soviets have announced that as of the fall of 1955, "more time will be devoted to teaching physics, chemistry, and biology by reducing the study of humanities to secondary importance." Humanities and social studies now constitute only about 47 percent of the entire secondary school program.

The emphasis on science in Soviet schools contrasts sharply with the situation in the United States. Whereas each of the more than 1 million Soviet students graduating from secondary schools last June had taken 5 years of physics, 1 year of astronomy, 4 years of chemistry, 5 of biology, 10 of mathematics including algebra, geometry, and trigonometry, less than a third of a total of approximately the same number of American high school graduates had taken as much as a year of chemistry. About a fourth had had a year of physics, and less than a seventh had taken any advanced mathematics. Although the usual American public school curriculum is 2 years longer than the Soviet 10-year curriculum, Soviet children attend school 6 days a week instead of our usual 5, and have a longer school year; as a result the total number of hours of instruction is about the

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same in both countries. In addition, the homework load of Soviet students beginning with the first grade is very heavy.

USSR Has No Shortage of Teachers

The sharpness of this comparison is heightened by the fact that in the United States few college students are being prepared to teach mathematics and the sciences at high school level. While high school enrollments in the United States are going upward steadily, the proportion of college graduates who qualify to teach high school mathematics and science continues to decrease. This past June only 249 men and women who had *specifically* prepared to teach high school physics were graduated from colleges or universities in the United States.[1] According to estimates based on past experience, only half, or about 125 of these graduates will actually go into teaching. What is happening in the teaching of physics also is true for chemistry, mathematics, and other scientific subjects.

The Soviets, on the other hand, seeking to avoid any teacher shortage for their rapidly expanding high school enrollment, have decreed this fall that henceforth 80 percent of all university graduates of philology, history, geography, and biology faculties and not less than 60 percent of the graduates of the physics, mathematics, and chemistry faculties will be directed to work as teachers in the Soviet 10-year schools. Because so many graduates will be working as teachers, university programs will require a 64-hour course in education and another equally long course in the methodology of teaching the student's major subject. During his 4th year, the Soviet university student will have 6 weeks of practice teaching. With this innovation, a gradual diminishing of the rigidity of the Soviet university curriculum seems to be under way, which will allow a more practical curriculum for students who will teach and at the same time allow the exceptional students destined for research careers to elect special classes.

The addition of more teachers from the universities under the new program to the already existing body of teachers from the pedagogical institutes should permit Soviet authorities to begin staffing all of their classrooms from grades 5 to 10 with qualified college-trained teachers, and those of their primary schools with teachers from the normal schools (2 years of college), as they have announced they would do. The resultant high level of teacher training in addition to a student-teacher ratio now estimated at less than 23 to 1 should be an important factor in maintaining a sound foundation in the sciences in Soviet secondary schools.

Soviets Are Building Large Secondary Schools

Furthermore, the Soviet policy of constructing large secondary schools—something like American union high schools—with boarding facilities if necessary to accommodate students from rural areas, enables school officials to concentrate adequate laboratory facilities in large centers rather than dilute them through distribution in many small schools. The average American high school has 200 students. Over half our high schools have less than 7 teachers, and over half do not offer courses in physics and chemistry. Large secondary schools also insure the implementation of the Soviet policy that specialized teachers teach specialized subjects, that is, a physics teacher teaches physics. This is again an important factor in the quality of training.

In the United States, on the other hand, because half of the American high school students—grades IX–XII—are in small schools with small teaching staffs, only a fraction of the secondary school science teachers teach a single science exclusively. In New York State, for example, 53 percent of the teachers reported three or more preparations per day. Fletcher Watson of the Harvard Graduate School of Education reporting on the findings of Don A. Orton's survey[2] of the specialization of Utah's certified high school teachers in 1948–49, said: "It is shocking to find over half the classes in biology, mathematics, and physical science being taught by persons holding neither a major nor a minor in the particular area."[3]

As in the United States, the quality of teaching and of school facilities varies in different sections of the Soviet Union. However, Soviet educational practice counteracts regional variations to some extent by standardizing the curriculums and text-

[1] Some States do not report the science major of students preparing to teach in high school, lumping all of them under the category "general science." However, only 7.6 percent of all students graduating in June 1955 who have prepared to teach in high school have majored in science—in biology, chemistry, physics, or general science.

[2] Don A. Orton. Appraisal of the Programs of Academic Specialization of Utah's High-School Teachers. Unpublished thesis, Harvard Graduate School of Education (1950).

[3] Fletcher G. Watson. Science Teaching in Secondary Schools. *Science*, Vol. 116, September 5, 1952, p. 262.

books throughout the country and by requiring State examinations at the end of the 4th, 7th, and 10th years. This practice enables the educational authorities to spot weaknesses in the instructional program in particular schools, districts, and republics.

The recent innovations in the Soviet secondary school program mark a new phase in the Soviet struggle to attain mass secondary education comparable quantitatively to that of the United States. Earlier, the primary function of the secondary school was to prepare a rather select group of people for higher education. A majority of the 10-year school graduates heretofore continued their education in colleges and universities. However, following the recent expansion of the secondary school system this function is no longer the main one. Only about 30 percent of the June 1954 secondary school graduates could be enrolled as full-time students in Soviet higher educational institutions.

Universities Have Raised Entrance Requirements

Because the number of vacancies in the colleges has not expanded in proportion to the rapidly increasing number of students graduating from secondary schools, the admission requirements for Soviet higher educational institutions have been raised. The Soviet Union announced this fall that there had been an average throughout the country of three applications for each vacancy, and that some schools and faculties had been "deluged" with applications. As a result of the keen competition, only the "gold medalists"—the straight A students from among the top 5 percent of the secondary school graduates—could enroll automatically in Soviet colleges. The long-honored right of the "silver medalists"—students with A's in the major subjects but B's in such subjects as physical education—to unchallenged entry to college was curtailed, and they too had to sit for the strenuous entrance examination schedule, this year more comprehensive and tougher than ever.

This situation has left the regime with the problem of making the best use of the remainder of the 10-year school graduates who do not get into higher education, of training them for or guiding them into nonprofessional jobs. These graduates have not wholly adapted themselves to the new situation, however, and are causing the Soviet authorities no little concern. Instead of taking jobs right away, many are staying at home, preparing to take entrance examinations to higher educational institutions the following year. The tradition among Soviet youth that those who have received a secondary education should not work with their hands persists. For example, of the 25,000 students graduating from Leningrad schools a year ago, only 400 were willing to take jobs in factories.

Schools Offer Technical and Vocational Training

At the present stage of its development the Soviet economy needs technicians and skilled laborers. Premier Bulganin reported to the Central Committee of the Communist Party on July 4, 1955, that the country was training a sufficient number of engineers and professional people for a while and should concentrate on training people for lower level jobs. This adjustment is taking place concurrently with the changes in the secondary school curriculum and with the setting up of new technical schools.

The new courses, which have been added to the 10-year school curriculum and some of the old courses which have been revised, introduce obligatory practical studies of future use to students who enter trade or technical work without obtaining a higher education. Such innovations include surveying, diagram and graph drawing, and calculating on the abacus. In grades 8 through 10, 2 hours a week are allotted to "practical study groups" devoted to agriculture, machine construction, and electro-technology with variations in emphasis for urban and rural students. This practical study is intended to acquaint students with the main implements and methods of mechanized processing, with the main types of power units, machine-driven implements, and the different mechanisms which convey and transform mechanical motions, technical electric measuring instruments, electric motors, generators, transformers, simple telephone and radio apparatus, and to provide students with opportunities to acquire practical ability in handling them. Students are now given more laboratory work and excursions to factories and construction sites to see how scientific and engineering principles are applied in industry. The time for the additional courses is provided by the elimination of "non-essential" subjects in the humanities, as mentioned before, and by further increasing the length of the school year.

The scientific and technical training provided by the regular Soviet 10-year secondary schools is in addition to existing technical training facilities such as the technicums and various factory and trade schools, which have produced large numbers of technically trained people. These training programs

have also been revised recently. The technicums, which in the past have offered 3- to 5-year courses in such subprofessional jobs as nursing and aviation mechanics for students with 7 years of general education, are adjusting their programs to 2- and 3-year courses for the 10-year graduate. Already over half the total technicum enrollment consists of 10-year graduates. Another important change has been the creation of vocational schools in the Labor Reserves network, which offer 1- and 2-year courses to the 10-year graduate in such specialties as the operation of coal cutting machines and machine tools. The technicums and the new vocational schools now absorb many of the 10-year graduates who do not get into higher educational institutions.

Curriculums Decrease Emphasis on Ideology

The new secondary school curriculum reflects the currently changing Soviet political line. Textbooks for the humanities and social studies courses are being rewritten. The disappearance of the Stalin cult, which formerly was fostered assiduously in schools, has led, for example, to the revision of the teaching of history, described in the Soviet press thus:

The general history curriculum has been made to accord with the new data of Soviet historical science. Particular attention has been paid to the decisive roll of the mass of people [i. e., not of one man—Stalin] as the maker of history.

The teaching of literature, too, which has long been a means for indoctrinating Soviet students through the special treatment of the works or passages studied, is to be less an "analysis of ideological content" and more of literary and artistic values "to which due attention was not paid in the old curriculum." The new policies, if carried out, will probably lessen the degree of impingement of Communist ideology on the secondary school program. The regime, of course, wants ideologically loyal youth, but, judging by the new curriculum, most of all technically competent youth.

Three Trends Are Apparent

At least three general trends in secondary education are indicated by the changes adopted by the Soviets. First, they are increasing their emphasis on scientific and technical training which, even before, was far more rigorous and prevalent than in the United States. Secondly, they are expanding their rate of high school equivalent graduations to approximate the volume of United States graduations, although they still lag in proportion to their larger total population. Lastly, they are orienting their secondary school curriculum to one of greater value for training more subprofessional technicians and laborers, the shortage of which now constitutes a major manpower problem for the Soviets.

College Housing Program

A POLICY STATEMENT on release of housing loan funds was made by John C. Hazeltine, Commissioner of the Community Facilities Administration, Housing and Home Finance Agency, November 14, 1955, before the Association of Land-Grant Colleges and Universities Annual Meeting at East Lansing, Mich. He announced that a decision had been reached at the top levels of the administration which would permit this program to develop without budgetary limits to the full extent authorized by the law.

This decision came as a result of a flood of applications received following enactment of the new amendments to the program by the 84th Congress, and signed by the President on August 11, 1955. Estimates of funds needed for the current fiscal year for such loans have become outdated almost overnight. The more favorable interest rate and broader scope of the program have sparked some of the new and additional loan requests. Moreover, increased enrollment in the fall of 1955 has forced colleges and universities to request loans for facilities required by these new students. It appears now that loan funds will be released as needed to meet approved applications.

NATO Fellowships

APPLICATIONS and supporting letters of reference for the NATO research fellowships, announced in the September 1955 number of *Higher Education*, should be submitted as soon as possible, and not later than January 1, 1956. Forms may be had from the Conference Board of Associated Research Councils, Committee on International Exchange of Persons, 2101 Constitution Ave., Washington 25, D. C.

Carleton College Shows The Way

The Liberal Arts College and Teacher Education

BY JOHN B. WHITELAW *

WHEN does stymied intellectual controversy cease to be amusing? When the type of action that will resolve the conflict has been clearly indicated.

In the field of teacher education the conflict between the liberal arts camp, on the one hand, and the practical school administrators and professors of education, on the other, has reached that state of boredom where further discussion can be generated only by the most outrageous statements from either side. Scholars, teachers, and administrators who are interested in the improvement of teaching now seek the type of action that may promise a mature and intelligent resolution of these conflicting points of view. A natural focus for such action is the education of secondary school teachers.

The Carleton Faculty Study of Teacher Education [1] provides a simple yet eloquent example of how a liberal arts college has grappled with this problem, has recognized its social responsibility for the professional preparation of teachers, and has taken the first steps to do something about it.

The Situation and a Proposal

Founded in 1866 by New England Congregationalists who had settled in Minnesota, Carleton College today is devoting its full resources to its liberal arts program for the bachelor's degree. The college is completely an undergraduate institution, having dropped the granting of a master's degree several years ago. The current coeducational enrollment is approximately 850.

For the period 1920–54, 30 percent of the total number of graduates were qualified to teach in secondary schools. Of these, 24 percent were men, and 76 percent were women. A severe drop in the number of men who were interested in teaching after 1938, a noticeable decline in the number of women candidates for teaching after 1945, together with the growing emergency in public education, caused members of the Carleton faculty to become deeply concerned about the college's responsibility for the preparation of teachers. Out of this concern emerged a proposal drafted by the dean of the college, Frank R. Kille, for "A Study To Determine the Best Possible Program for the Education of Secondary School Teachers in a Small College of Liberal Arts."

The proposed study "recognized the logical relationship between the decrease in prospective teachers at Carleton and the rising storm of criticism of public education on a national scale. It called the conflict between the professional educators and the partisans of the liberal arts both bitter and destructive and pronounced it the more regrettable since society must continue to draw teachers from both liberal arts colleges and teachers colleges and since both profess the same desire to supply teachers of broad and liberal education. At the heart of the conflict, it noted, important basic philosophy is involved in the heated question of how much and what kind of specialization and professional education a teacher needs."

Organization

As a result of this proposal, a three-man faculty committee was appointed to plan and steer a seminar on teacher education. The three members were an assistant professor of English, an associate professor of government, and a professor of botany. In addition, the dean of the college was a member of the committee, representing the administration, ex officio; and an associate professor of education met with the committee as a consultant.

It should be noted here that in a full-time faculty of approximately seventy, there was one lone full-time staff member, an associate professor, who gave all the regular courses in education, except the special methods courses, and who supervised student teaching as well.

"In order to provide balance and to facilitate the discovery of the possible areas of agreement between liberal arts people and professional educators, the

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[1] *The Carleton Faculty Study of Teacher Education*, Reports of the Planning Committee and Visiting Consultant. Carleton College, Northfield, Minn. 1955. 46 p.

plan called for the selection of an outstanding member of a teachers college faculty to serve as chairman for the seminar discussions and as visiting professor of education on the Carleton faculty." For this position, Carleton secured Paul Woodring, professor of psychology at Western Washington College, and author of *Let's Talk Sense About Our Schools.*

Support for the project was obtained from the Fund for the Advancement of Education in January 1954. The Planning Committee met in May and sent invitations to the seminar to all members of the faculty. The seminar had its initial meeting on September 21, 1954, and met thereafter on Tuesday evenings, from 8 to 10 p. m., until Christmas; there were 13 meetings.

The project was fortunate in having a hard-working Planning Committee. Careful preparations were made for each meeting; abstracts and reading suggestions were distributed to all seminar participants; a library of selected reading materials was set up; and members of the faculty were encouraged to combine on-the-spot observations of modern high school practices with their reading and seminar discussions.

The following guest consultants participated in the seminar: Henry J. Fuller, University of Illinois, of "The Emperor's New Clothes or *Prius Dementat*" fame; Willard E. Goslin, George Peabody College for Teachers and former Superintendent of Schools in Pasadena; Henry Dyer of the Educational Testing Service; Earl S. Johnson, University of Chicago; T. J. Berning, Assistant Commissioner of Education, Minnesota; and Floyd Adams, Director of Teacher Certification and Placement, Minnesota State Department of Education.

Thirty percent of the faculty attended the seminar regularly. Fifteen of the twenty departments of the college were represented. On those evenings when visiting lecturers were featured, there was, of course, greater general attendance.

The 46-page bulletin consists of 3 reports—2 by members of the Carleton faculty, and 1 by Dr. Woodring.

Survey of Education

The first report, entitled: "Problems of the Modern High School," reviews the current criticisms of the modern public secondary school and outlines two contrasting approaches to the high school curriculum: the classical thesis and the pragmatic thesis. These were reconciled by the chairman of the seminar into a statement of 10 principles of modern secondary education to which most members of the seminar were able to subscribe. Without being presumptuous, it may be stated that there is unmistakable evidence of significant growth in the capacity of the members of the faculty to comprehend the practical problems of the modern high school. That is the primary objective for the first phase of such a study project. It may be assumed that, once a college faculty truly understands the nature and scope of the problem, action will be taken to find a solution.

What the College Should Do

The second report, entitled: "The Role of the College in Improving Secondary School Education," weaves together the thinking of the seminar regarding the staggering problems of mass education, concern for individual differences, and the education of the whole child. It recognizes that the faculty of a liberal arts college has an inescapable responsibility to stand for a philosophy of education that is rooted in the liberal arts conception of man. Moreover, it asserts that a community of scholars should attempt actively to influence the community at large to accept a philosophy of education consonant with that of a liberal arts college. The obvious hook in this, of course, is that you must know thoroughly what you are trying to sell before you can start selling it.

This second report also points out that college professors have little first-hand knowledge of the modern high school, and that many professors tend to discourage able students from going into secondary school teaching without being adequately informed themselves about current conditions and opportunities in that field. It emphasizes that through neglect of high school teachers by their subject-matter counterparts on college faculties, the high school teachers feel welcome on the college campus only in the department of education. Members of the seminar apparently recognize that every college professor has a direct professional stake in the quality of high school teaching, and the opportunity to improve high school teaching in his own subject field is his for the taking.

The seminar appeared to be genuinely puzzled in trying to decide what to do about professional education courses (the national average of 18 hours of professional education courses for secondary school teaching is also that of Minnesota). The seminar concluded that the solution appeared to be through closer working relations between the subject-matter

departments and the department of education and through genuine integration in programs of teacher education.

The idea of a fifth year was definitely discarded by this seminar.

Finally, the report reasserts that the true function of a liberal arts college is not prevocational or preprofessional preparation, but is rather to turn out individuals of broad vision and wide intelligence who are imaginative in the best sense of the word.

The continuing problem, then, is how to integrate a sound program of teacher education with this basic premise.

Faculty Recommendations

At the conclusion of its meetings, just before Christmas 1954, the Faculty Seminar on Teacher Education approved the following resolution:

We propose the institution of a new regular standing committee of the faculty

Whose members will be chosen from the faculties of those subject-matter departments for which there are counterparts in secondary schools

To be responsible for

1. Coordination among subject-matter departments in the approach to teacher education, particularly in special methods courses.
2. Liaison between subject-matter fields and the Education Department.
3. Establishing and maintaining liaison between Carleton's teaching staff and classroom teachers in secondary schools.
4. Making available to interested students such information and guidance as would be helpful in deciding upon, or preparing for, secondary school teaching in particular subject-matter fields.
5. Promoting the general recognition, by students, faculty, and public, of the fact that secondary school teaching is a responsibility and worthwhile career of public service and one in which many graduates of this college could make great contributions.

Report of Visiting Consultant

The third report, that by Dr. Woodring, the visiting professor and chairman of the seminar, discusses the strengths and weaknesses of Carleton as a college for teacher preparation, evaluates the seminar, and summarizes conclusions and recommendations.

The following "Suggestions for Other Colleges or Universities Contemplating Similar Studies" may be of interest:

It is the opinion of the consultant that the Carleton Study was well worth the time, energy, and money expended upon it. It does not automatically follow that such a study will be profitable on other campuses. It will be worth while *if*:

1. The administration of the college is concerned about the problems of teacher education and will give the necessary support to the study.
2. There is a nucleus of faculty members other than professors of education who are interested in these problems. This nucleus need not be large but it must exist. It is not necessary that any members of the faculty be sympathetic with contemporary trends in teacher education, but it is necessary that some be aware of the problems and be willing to look for solutions.
3. A suitable consultant is available who can give his full time to the project. This consultant should be reasonably familiar with contemporary secondary education and with the problems involved in teacher education. He should also have an understanding of liberal education and be reasonably sympathetic with the aims of the liberal arts college.
4. Funds are available—
   a. To provide an adequate stipend for the visiting consultant.
   b. To bring in other consultants on a temporary basis to represent divergent points of view. (It was the opinion of some members of the Planning Committee, however, that these temporary consultants were of dubious value—that the seminar made more progress when outsiders were not present, since nearly all possible points of view were represented and well defended by members of the regular seminar group.)
   c. To free members of the faculty planning committee from part of their regular teaching load so that they can give ample time to the study.
   d. To enable faculty members to visit high schools or to bring in high school teachers and administrators for consultation.

Given these conditions, a study such as this can profitably be carried out on any campus, and a series of such studies could do much to resolve some of our pressing problems in teacher education.

In providing us with this stimulating and eminently practicable example of the kind of intellectual brush-clearing, ploughing, and harrowing that is greatly needed today on many college and university campuses, the Carleton faculty and administration have demonstrated how latent or open conflict in educational philosophy must give way to mature, cooperative endeavor in tackling one of the most challenging jobs for higher education: staffing the nation's schools and colleges with qualified teachers.

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*American colleges and universities must * * * become the means by which every citizen, youth, and adult is enabled and encouraged to carry his education, formal and informal, as far as his native capacities permit.*—The President's Commission on Higher Education.

Earned Degrees Conferred: 1954-55

IN RESPONSE to wide demand for the information, the Office of Education annually collects data on the number of earned degrees conferred by institutions of higher education. In the accompanying table, degrees are classified in the stub by *field of study*, and in the boxhead by *level* and by *sex*.

The "1st-level degree" refers to the *bachelor's or first professional degree* in a given field of study. The "2d-level degree" refers to degrees *beyond the first level but below the doctorate;* in general, the 2d-level degrees are master's or second professional degrees. When a master's is the *first professional* degree in a given field—as occurs generally, for example, in social work and library science—the degree has been tabulated as a "1st-level" degree in that field. The doctorate includes such advanced degrees as the Ph. D., Ed. D., D. Eng., Dr. P. H., but not the M. D., D. D. S., and D. O., which are *first professional* degrees. The data include degrees conferred in continental United States and in the outlying parts.

Earned degrees conferred, by field of study, level of degree, and sex of recipient: 1954–55 (aggregate United States)

Field of study	1st-level degree in given field of study			2d-level degree in given field of study			Doctorate		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
All Fields	287,401	183,602	103,799	58,204	38,740	19,464	8,840	8,014	826
Agriculture	7,170	7,052	118	1,364	1,336	28	507	499	8
Animal husbandry	1,158	1,132	26	132	129	3	72	70	2
Forestry	852	851	1	129	126	3	29	29	----
Agriculture—all other	5,160	5,069	91	1,103	1,081	22	406	400	6
Biological sciences [1]	9,050	6,519	2,531	1,609	1,224	385	994	895	99
Anatomy	75	70	5	29	19	10	37	33	4
Bacteriology	414	233	181	233	176	57	131	117	14
Biochemistry	144	124	20	142	109	33	147	136	11
Biology	5,493	3,946	1,547	446	311	135	150	135	15
Botany	302	199	103	173	136	37	151	141	10
Entomology	61	56	5	116	113	3	66	65	1
Physiology	100	47	53	88	65	23	57	49	8
Zoology	1,648	1,218	430	264	200	64	196	177	19
Biological sciences (n. e. c.)	813	626	187	118	95	23	59	42	17
Education [2]	53,254	14,871	38,383	27,620	15,108	12,512	1,470	1,221	249
Education	43,208	7,418	35,790	25,844	13,655	12,189	1,356	1,128	228
Industrial arts	2,738	2,674	64	544	540	4	14	14	----
Physical education	7,308	4,779	2,529	1,232	913	319	100	79	21
Engineering [3]	22,589	22,527	62	4,484	4,471	13	599	599	----
English	13,099	5,121	7,978	1,669	835	834	341	289	52
Fine arts	16,317	7,606	8,711	3,184	2,040	1,144	256	224	32
Architecture	1,581	1,482	99	180	173	7	3	3	----
Music	6,339	2,553	3,786	1,677	1,062	615	68	62	6
Speech and dramatic arts	3,682	1,789	1,893	776	466	310	157	136	21
Fine arts (n. e. c.)	4,715	1,782	2,933	551	339	212	28	23	5
Foreign languages	3,548	1,413	2,135	789	409	380	187	144	43
Classical foreign languages	512	379	133	142	89	53	35	25	10
French	1,279	363	916	243	110	133	52	42	10
German	315	183	132	100	59	41	26	20	6
Spanish	1,206	377	829	227	104	123	39	29	10
Russian	60	43	17	21	10	11	9	3	6
All other modern foreign languages	176	68	108	56	37	19	26	25	1
Geography	626	496	130	141	116	25	48	44	4
Healing arts and medical sciences [1]	23,299	15,998	7,301	1,750	1,016	734	189	164	25
Dentistry, D. D. S. only	3,099	3,071	28	----	----	----	----	----	----
Dental science	361	206	155	116	116	----	----	----	----

Earned degrees conferred, by field of study, level of degree, and sex of recipient: 1954–55 (aggregate United States)—Continued

Field of study	1st-level degree in given field of study			2d-level degree in given field of study			Doctorate		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Healing arts and medical sciences [1]—Continued									
Medicine, M. D. only	7,056	6,718	338	----	----	----	----	----	----
Nursing	5,240	61	5,179	550	10	540	3	----	3
Optometry	524	519	5	1	1	----	----	----	----
Osteopathy	460	452	8	5	5	----	----	----	----
Pharmacy	3,396	3,065	331	131	115	16	67	60	7
Public health	140	79	61	521	397	124	30	24	6
Veterinary medicine, D. V. M. or higher	855	844	11	28	27	1	6	5	1
Medical sciences (n. e. c.)	2,168	983	1,185	398	345	53	83	75	8
Home economics	7,250	81	7,169	705	18	687	61	14	47
Journalism	2,218	1,418	800	286	235	51	16	16	----
Law, LL.B. or higher	8,226	7,937	289	373	357	16	22	21	1
Library science [4]	1,536	379	1,157	287	69	218	4	3	1
Mathematics	4,034	2,724	1,310	761	613	148	250	239	11
Military or naval science	1,629	1,627	2	----	----	----	----	----	----
Physical sciences [5]	10,516	9,134	1,382	2,544	2,337	207	1,713	1,661	52
Astronomy	11	10	1	13	10	3	16	15	1
Chemistry	5,920	4,781	1,139	1,173	1,036	137	1,005	969	36
Geology	1,795	1,703	92	507	481	26	154	152	2
Metallurgy	12	12	----	27	22	5	15	15	----
Meteorology	60	58	2	45	41	4	2	2	----
Physics	1,996	1,920	76	729	701	28	511	499	12
Physical sciences (n. e. c.)	722	650	72	50	46	4	10	9	1
Philosophy	1,774	1,473	301	231	195	36	84	76	8
Psychology	5,532	3,009	2,523	1,293	876	417	688	604	84
Religion	7,713	6,447	1,266	1,274	1,031	243	210	197	13
Religious education and Bible	3,189	2,022	1,167	581	365	216	61	53	8
Theology	4,524	4,425	99	693	666	27	149	144	5
Social sciences [6]	77,378	59,550	17,828	7,501	6,213	1,288	1,170	1,076	94
Basic [6]	27,666	19,606	8,060	3,090	2,368	722	963	890	73
Anthropology	280	130	150	87	55	32	44	39	5
Economics	6,364	5,678	686	617	539	78	241	232	9
History	9,540	6,707	2,833	1,199	833	366	310	282	28
International relations	449	343	106	215	179	36	20	19	1
Political science	5,500	4,415	1,085	498	414	84	181	171	10
Sociology	5,533	2,333	3,200	474	348	126	167	147	20
Applied	43,931	36,535	7,396	3,799	3,406	393	163	148	15
Business and commerce—Accounting	7,885	7,406	479	558	533	25	19	17	2
Business and commerce—All other	33,770	28,158	5,612	2,778	2,555	223	125	117	8
Public administration	386	367	19	265	233	32	12	11	1
Social work [4]	1,890	604	1,286	198	85	113	7	3	4
Social sciences (n. e. c.)	5,781	3,409	2,372	612	439	173	44	38	6
Miscellaneous:									
Arts (without major)	6,400	4,691	1,709	163	107	56	8	7	1
Sciences (without major)	3,707	3,106	601	117	97	20	4	4	----
Other	536	423	113	59	37	22	19	17	2

[1] Does not include *psychology*, which because of its multicategory nature has been listed independently.

[2] Students in secondary education generally major in particular subjects, such as English, history, mathematics, at the same time they are preparing to teach. In the current survey, when (as occurs especially in teachers colleges) all or nearly all degrees in an institution were reported under "education," an attempt was made through correspondence with the institution to distribute such degrees according to the major field of specialization.

[3] For a breakdown of engineering degrees, see circular entitled "Engineering Enrollments and Degrees, 1955," scheduled for publication in early 1956.

[4] In those schools where the master's degree is the first professional degree, the students receiving the master's degree are included in columns 2–4, as recipients of the *first professional* degree.

[5] Does not include *geography*, which is listed independently.

[6] Does not include *geography*, *philosophy*, or *psychology*, which because of their multicategory or comprehensive nature have been listed independently.

Graduate Student Enrollments, Fellowships, and Assistantships*

TWENTY-FIVE percent of the graduate students in the United States were receiving financial assistance in the form of fellowships, teaching assistantships, or research assistantships in April 1954. Approximately one-third of the graduate students were enrolled in the field of education, one-fifth in the natural sciences, one-tenth in engineering, and one-tenth in the humanities and arts. The median stipend for teaching assistants was $1,201, and for research assistants $1,478.

These and many other significant findings of a survey covering 152,067 resident graduate students in 330 institutions of higher education are contained in a recent bulletin published by the National Science Foundation.[1] The survey covered students in the biological, physical, and social sciences, the humanities, and in many of the professional fields. Students enrolled for professional degrees in law, theology, nursing, and for the first professional degrees in medicine (M. D.), dentistry (D. D. S.), and veterinary medicine (D. V. M.) were excluded. For this reason information on the professional fields, particularly the health professions, is more limited than on the other fields covered.

Of those students who had completed less than one full year of graduate study about 42 percent were following full-time programs, with a wide variation among major fields, from 26 percent in education to 86 percent in the health professions. Of students who had completed at least one full year of graduate study about 56 percent were in full-time programs, with a range from 28 percent in education to 85 percent in the health professions.

Graduate Students

Table 1 below is a condensation of a similar table in the bulletin. The fields listed in table 1 are given in more detail in the bulletin and presumably will be still further broken down in the publication which is to follow. It is believed that table 1 is self-explanatory with the possible exception of the headings of columns 5, 6, and 7. Column 5 shows for each field the percentage of students who have completed at least one full year of graduate study. In column 6 "1st year students" means those who have completed less than one full year of graduate study, and the figures in this column indicate for each field the percentage of such students who were enrolled full time. Similarly, in column 7 is shown for each field the percentage of "advanced" students who were enrolled full time.

Graduate Students Receiving Assistance

Table 2 is a condensation of three tables in the bulletin, which give the same breakdown by fields as the first table. They also break down the figures shown in table 2 in columns 4, 5, and 6 into first-year students and advanced students. The material shown in table 2 in columns 7, 8, 9, and 10 is given much more extensively in the bulletin, which shows for each field the percentage distribution of stipends into the categories of under $800, $800 to $1,399, $1,400 to $1,999, and $2,000 and over.

The bulletin calls attention to the fact that the proportion of graduate students receiving financial assistance appears to vary according to the percentage in the field who were enrolled as full-time students. Probably many teaching and research assistantships and fellowships were held by full-time rather than part-time students. It is probable that a larger proportion of part-time than of full-time graduate students utilized paid employment outside the institution as a means of financing their graduate study.

Sources of Assistance Funds

An additional table in the bulletin classifies all stipends for assistantships and fellowships according to two major sources of funds, institutional and non-institutional. The non-institutional funds are further subdivided into "Federal" and "other" sources, which include industrial donors, foundations, State and local governments, and other non-institutional sources. The breakdown by fields in the bulletin table is less extensive than in the tables abstracted

*Reported by Henry H. Armsby, chief for engineering education, Office of Education.

[1] Scientific Manpower Bulletin Number 5—"Highlights of a Survey of Graduate Student Enrollments, Fellowships, and Assistantships, 1954"—is available in limited numbers from the Foundation, Washington 25, D. C. More nearly complete data will be published later by the Foundation.

Table 1.—Graduate students by field, sex, first-year and advanced status, and percent of full-time students, April 1954

Field	All graduate students		Percent of total students		Percent of 1st year students who are full time	Percent of advanced students who are full time
	Number	Percent	Male	Advanced		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
All fields	152,067	100.0	73.6	38.5	41.7	56.1
Life sciences	11,930	7.8	86.9	60.0	73.3	74.3
Physical sciences	19,009	12.5	93.6	56.1	61.8	73.2
Engineering	14,249	9.4	99.5	32.1	30.0	42.3
Psychology	5,444	3.6	75.1	59.7	61.3	63.3
Social sciences	15,405	10.1	79.3	47.7	58.6	61.8
Humanities and arts	9,289	6.1	61.8	49.3	55.9	62.3
Health professions	1,323	0.9	87.1	52.5	86.3	85.0
Education	51,053	33.6	56.9	25.0	26.2	27.6
Other professional fields	24,365	16.0	71.2	30.5	48.6	56.5

Table 2.—Graduate students holding assistantships and fellowships by field, and median stipends, April 1954

Field	Graduate students with assistantships or fellowships		Percentage distribution of supported students			Median stipend (in dollars)			
			Assistantships			Assistantships		Fellowships	
	Number	Percent of graduate students in field	Teaching	Research	Fellowships	Teaching	Research	Institutional	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
All fields	37,658	24.7	43.9	31.5	24.6	1,201	1,478	890	1,479
Life sciences	7,839	65.7	33.9	48.8	17.3	1,256	1,488	1,130	1,550
Physical sciences	11,178	58.8	47.6	35.3	17.1	1,243	1,538	1,090	1,531
Engineering	3,594	25.2	28.2	46.9	24.9	1,408	1,820	1,097	1,493
Psychology	1,719	31.6	46.4	36.5	17.1	1,143	1,205	828	1,796
Social sciences	3,710	24.1	46.1	21.1	32.8	1,087	1,186	850	1,500
Humanities and arts	2,995	32.2	71.8	4.1	24.1	1,218	902	853	1,221
Health professions	528	39.9	21.6	18.5	59.9	1,403	2,054	1,885	2,414
Education	1,844	3.6	56.6	16.0	27.4	933	1,091	699	925
Other professional fields	4,251	17.4	40.5	11.1	48.4	981	951	575	1,210

here. The fields covered are life sciences, physical sciences, engineering, social sciences, and "other professional fields."

The data in this table show that about 64 percent of the graduate students receiving support were paid from institutional funds. About 44 percent were teaching assistants, and the remainder were divided nearly evenly between those holding research assistantships and those holding fellowships.

Of the graduate students who received assistance from non-institutional sources, 19 percent were supported from Federal sources—16 percent holding research assistantships and 3 percent fellowships—and 17 percent from non-Federal sources.

Engineering was the only major field in which the number of students receiving assistance from non-institutional sources was greater than the number supported by institutional funds. More of these students held research assistantships supported by Federal funds than teaching assistantships.

Institute for College and University Administrators

By F. L. WORMALD*

THE INSTITUTE for College and University Administrators, conducted by the Harvard Graduate School of Business Administration, was an experiment in a hitherto neglected field. Its aim was to give newly appointed college presidents an opportunity of enlarging and deepening their understanding of the president's task by discussing through the case-study method the kind of problems he encounters in his daily work. The institute was financed by the Carnegie Corporation of New York and sponsored by the Association of American Colleges.

Persons in Attendance

The heads of the 714 colleges and universities that are members of the Association of American Colleges and heads of 80 comparable institutions were invited to apply for admission to the institute if they had held a presidential post for 3 years or less. In view of the important role that the president's wife usually plays in college life, wives were included in the invitation. Since applications greatly exceeded the number of available places, candidates for admission were selected by an informal committee representing the three bodies cooperating in the organization of the institute. In making its selection the committee sought to assemble a group of presidents as widely representative as possible of both geographical areas and institutional types.

In the outcome, 39 presidents attended the institute. They came from Alaska and Puerto Rico and 25 States of the Union extending from Massachusetts to Texas and from Oregon to Florida. They represented 7 publicly supported institutions of various types (including a Federal military academy), 10 independent colleges or universities, and 22 church-related institutions distributed among 9 denominations. The 39 institutions ranged in size from less than 500 students to more than 10,000, but the smaller colleges predominated, as they do in the whole body of American institutions of higher education. Thirty-four of the presidents were married men, and all but one of them were able to take their wives to the institute.

The institute was held at the Harvard Business School for the 6 days June 19–24, 1955. To enable the participants to accommodate themselves with the minimum of inconvenience to a highly concentrated work schedule, the institute arranged for them to board and lodge on the campus, within a few hundred yards of the lecture rooms in which discussion sessions were held.

The Program

For discussion sessions, the presidents met in one group, and their wives in another: the presidents from 8:10 a. m. to 12 noon and again from 1:10 to 5 p. m.; the wives in the afternoon only. The presidents' morning sessions and the earlier part of the afternoon sessions of both groups were devoted to the discussion of cases prepared for the institute by a team of case writers with the cooperation of college presidents up and down the country. Every case was authentic, with only names and minor details altered to protect the contributors. The 22 cases discussed covered almost every aspect of a president's responsibilities and of his wife's problems. The discussion was directed by three professors of the Harvard Business School skilled in the case leader's art of drawing out the views of a discussion group without obtruding his own and keeping the argument going along lively and illuminating lines.

For each group the afternoon session concluded with a brief talk from a visiting discussion leader (usually an experienced president or president's wife) followed by general discussion. On five nights out of the six, the whole body reassembled after dinner for an address by a distinguished educationist. The rest of the evening was free for study of case material.

Evaluation

At the end of a strenuous week, the presidents and their wives met in a single group to discuss the merits and drawbacks of the process they had gone through. They expressed differing views about the composition of the group, the choice of cases, the duration of the institute, and the distribution of time between case discussions and meetings with visiting speakers, but no difference of opinion about the value of the experiment. They agreed that the institute was a convincing demonstration of the efficacy of the case-

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study method as applied to college administration.

Many presidents testified that the institute had afforded them insights that might have taken years of practical experience to acquire and a perspective which would clarify their thinking about their day-to-day problems. No less valuable was the antidote the institute provided to the president's characteristic feeling of isolation, by showing that most of his difficulties are the common lot of college presidents and by fostering a sense of comradeship that took no account of institutional differences, whether of size, location, race, creed or government.

Grant for Student Leadership

THE U. S. National Student Association has received a $128,000 grant from the Ford Foundation for a 4-year program to develop leadership skills, professional abilities, and knowledge of and experience with democratic institutions among the student leaders of the underdeveloped areas of the world. The grant, which is the largest in the association's history, will make it possible for 15 or more student leaders from Asia, Africa, the Near East, and other countries to spend a year at selected colleges and universities in this country working with student organizations at the campus, regional, and national level.

Selection of the participating colleges and universities and of the individual overseas students is expected to be completed by next May. The institutions will be selected on the basis of their ability to provide the facilities, academic and extracurricular environment, and student and staff personnel which will provide the most meaningful experience for the foreign student leaders. Particular emphasis will be placed on the structure and effectiveness of organizations of student self-government as a model of democratically organized institutions.

National Science Foundation Fellowships

THE National Science Foundation will extend its fellowship awards program during 1956 to include approximately 40 senior post-doctoral fellows in life and physical sciences and closely allied fields. Under the broadened program, fellowships will be awarded in mathematical, physical, medical, biological, engineering, and other sciences, including anthropology, psychology (other than clinical), geography, and certain interdisciplinary fields.

To be eligible for the new awards, candidates must be citizens of the United States with demonstrated ability and special aptitude for advanced training and productive scholarship in the sciences. In addition, candidates must have at least 5 years experience beyond the science doctorate or its equivalent.

Fellows will be selected on the basis of ability as shown by letters of recommendation, academic records, and other evidence of attainment. Candidates' qualifications will be evaluated by carefully chosen panels of scientists. Final selection of fellows will be made by the National Science Foundation. Successful competitors will be announced in March 1956. Stipends from $4,000 to $10,000, adjusted to match as closely as feasible the regular salaries of the award recipients, may be applied toward study or research in nonprofit institutions of higher learning in the United States or abroad.

Applications may be obtained from the Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D. C. Completed material must be received not later than January 16, 1956.

Education, Training, and Supply of Soviet Professional Manpower

THE SOVIET UNION is graduating almost twice as many technical specialists in certain fields as the United States. Between 1928 and 1954 the Soviet Union graduated about 682,000 professionals in the engineering fields, as against 480,000 in the United States during roughly the same period. Agricultural graduates in the Soviet Union totaled about 244,000, as against 133,000 in the United States; and Soviet graduates in medicine outnumbered those in the United States two to one, 320,000 against 148,000.

These and other findings are presented in a definitive study, *Soviet Professional Manpower*, by Nicholas De Witt, being published by the National Science Foundation in cooperation with the National Academy of Sciences—National Research Council. The book is the result of more than 2 years of research on the Soviet educational system and on the supply and distribution of its professional manpower.

Universal education falls far short of achievement in the Soviet Union, and educational opportunities are generally more limited than in the United States. Soviet higher educational establishments graduated

only half as many persons in all fields as the United States did during the last 25 years, but Soviet educational policy and practices have been shaped to meet the growing needs for scientific and technical manpower, with the result that from a very much smaller educational base the Soviet Union is turning out a higher number of trained specialists than the United States is.

Soviet production of trained specialists is achieved by sacrificing other elements that the democracies regard as important, however. The Soviet Union has a drastically small number of graduates in the humanities, whereas between 65 and 70 percent of all graduates in the United States are in the social sciences and the liberal arts.

The high ratio of technical specialists in Soviet graduating classes and the number of trained professionals in the labor force (about 47 trained professionals per 1,000 workers and employees) is achieved by early specialization and strong incentive awards for scientists and engineers. Specialization begins in the secondary schools where 40 percent of all instruction is devoted to science. The preferential treatment of professionals with respect to military duty, monetary rewards, social prestige, choice living accommodations, and so on, strongly motivates Soviet youth toward careers in science and engineering. Once committed to such careers, however, Soviet young people are not free to change their minds. Job placement is involuntary and coincides with the field of formal training. Stringent labor laws impose severe restrictions on changes of occupation. Although the Soviet ratio of graduate professionals to total population is low (about 80 per 10,000) as compared with 320 per 10,000 in the United States, the Soviet Union is making rapid strides. In 1926 the figures were only 12 per 10,000 population.

Soviet concentration on increasing the number of trained professionals in the labor force is indicated by the great emphasis laid on improving the educational system. Of the 2 million professionals in the Soviet Union in 1954, about 42 percent were trained for, and employed in, the field of education. The remainder was distributed as follows: 27 percent in engineering and related fields and employed in industry, manufacturing, mining, transportation, and communication; 16 percent in health fields; 9 percent in agricultural fields; and only 6 percent in all socioeconomic service fields. A similar situation obtains with respect to semiprofessionals.

The book is for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., at $1.25 a copy.

How the Profession Lost a Teacher

President John A. Perkins of the University of Delaware relates the following incident to explain how industry is contributing to the present and ever-growing shortages of teachers.

WITHIN THE PAST WEEK, our State has lost a potential high-school science teacher before he ever set foot in a classroom—a Delaware senior whose original goal was to become a teacher. This science major, who is a very personable young man but who has attained only an average scholastic record, has been offered a starting salary of almost $6,000 a year by a Delaware corporation. While we are pleased with this student's good fortune, there is no mystery about the shortage of teachers when incidents such as this point to what is generally prevalent. Here is a student with no unusual scholastic achievement, no previous experience or exceptional talent being offered a starting position in industry at a salary higher than he could ever earn in the public schools of Delaware. Not only does this wage represent more than any of our high-school teachers are earning, but it is $1,000 greater than that paid to assistant professors at the University of Delaware. In fact, this salary is almost as much as we pay our associate professors who have a doctor of philosophy degree and many years of experience.

The long-run effect of this inequity in the salary situation means that these very industries which are now hiring inexperienced people and must pay such good wages to secure them will soon have no one to hire because there will be no adequately trained teachers in the schools and colleges to instruct them. Knowing its dependence upon trained scientists and technologists, industry in enlightened self-interest in Delaware and elsewhere ought to be virtually volunteering to pay more taxes for the support of education. The corporations which are beginning to respond to the desperate situation of the private schools should likewise be aware of the public institutions and their dependence upon adequate taxation. After all, 55 percent of our students are in publicly supported institutions of higher education and their training holds the key to industrial prosperity and to welfare of the country as a whole.

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From the Office of Education

Clerical and Custodial Staff in Public Secondary Day Schools, by Ellsworth Tompkins and Mabel C. Rice. U. S. Government Printing Office, Washington, D. C., 1955. Circular No. 445. 83 p.

Education Directory, 1954–55, Part 4, Education Associations, by Edith H. Rogers. Washington, U. S. Government Printing Office, 1955. 56 p. 25 cents.

Education in Honduras, by M. Weldon Thompson. Marjorie C. Johnston, *ed.* Washington, U. S. Government Printing Office, 1955. 33 p. 20 cents. (Bulletin 1955, No. 7.)

Education in the United States of America. Washington, U. S. Government Printing Office, 1955. 72 p. 45 cents. (Special Series No. 3, revised 1955.)

High School Graduation Requirements Established by State Departments of Education, by Grace S. Wright. Washington, D. C., 1955. Circular No. 455. 14 p.

Programs Below the Bachelor's Degree Level in Institutions of Higher Education 1953–54, by Alice Yeomans Scates. U. S. Government Printing Office, Washington, D. C., 1955. Bulletin 1955, No. 9. 50 p.

Resident, Extension, and Adult Education Enrollment in Institutions of Higher Education: November 1954, by William A. Jaracz and Mabel C. Rice. Washington, D. C., 1955. Circular No. 454. 34 p.

State Provisions for Transporting Pupils, by E. Glenn Featherston. Washington, D. C., 1955. Circular No. 453. 18 p.

Strengths and Weaknesses of the Junior High School. Report of the National Conference on Junior High Schools, Washington, D. C., Feb. 24–26, 1955, by Walter H. Gaumnitz. Washington, U. S. Government Printing Office, 1955. 56 p. 40 cents. (Circular No. 441.)

From Other Government Agencies

National Academy of Sciences-National Research Council, Office of Scientific Personnel. *The Baccalaureate Origins of the Science Doctorates Awarded in the United States From 1936 to 1950 Inclusive.* Washington, 1955. 158 p. Proc. paper, $2. (Publication 382.)

Soviet Professional Manpower; Its Education, Training, and Supply, by Nicholas De Witt. Washington 25, D. C., U. S. Government Printing Office, 1955. 400 p. Paper, $1.25.

Non-Government Publications

Obtain direct from the publishers. Prices are indicated when known.

Academic Freedom in Our Time, by Robert M. MacIver. New York 27, N. Y., Columbia University Press, 1955. 329 p. $4.

Discusses the major causes and conflicts of academic freedom today; exposes the economic interests and social prejudices that have animated various groups to band together to assail academic freedom. Emphasizes the obligations of the educator as well as his rights in this area.

American Annals of the Deaf, Sept. 1955 (Vol. 100). Special number listing 150 Doctor's Dissertations and 960 Master's Theses on the Education of the Deaf, 1897–1955. Gallaudet College, Washington 2, D. C., The Editor, American Annals of the Deaf. $2 for the special edition.

The Church and the Four-Year College: An Appraisal of Their Relation, by Guy E. Snavely. New York 16, Harper & Bros., 1955. 216 p. $3.50.

A reference work and a record of the evolution of the American church college and its supporting agencies. Following a statement on the church college today, there are 55 pages on the church and the colonial colleges. Subsequent chapters deal with various denominations and the colleges: Baptist, Congregational, Disciples of Christ, Lutheran, Methodist, Presbyterian, Roman Catholic, and others. Chapters on church colleges that became State colleges, church boards of education, and the church college tomorrow complete the book. Much specific information is given on individual colleges.

The Development of Academic Freedom in the United States, by Richard Hofstadter and Walter P. Metzger. New York 27, N. Y., Columbia University Press, 1955. 527 p. $5.50.

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The first comprehensive treatment of the development of academic freedom in the United States. Beginning with the foundations of academic freedom in the achievements of the medieval masters, the authors treat the origins of academic freedom, its European background, and its evolution in the distinctly American system of education up to the present day.

Educational Motion Pictures, 1956 Catalog. Descriptive catalog containing subject and grade level index for 16 mm. motion pictures which may be rented from the Indiana University Audio-Visual Center. Bloomington, Ind., Audio-Visual Center, Indiana University, 1955. 557 p. Single copy free to all users of motion pictures.

Higher Education Under Stress. The Annals of The American Academy of Political and Social Science. September 1955 (Vol. 301). Philadelphia, Pa., The Academy, 1955. 272 p. $2 (paper), $2.50 (cloth).

Contains foreword and 22 articles on higher education and a number of book reviews on various subjects other than higher education.

A Manual on Certification Requirements for School Personnel in the United States, including requirements in the 48 States, Alaska, District of Columbia, Hawaii, and Puerto Rico, 1955 Edition, by W. Earl Armstrong and T. M. Stinnett. Washington 6, National Education Association of the United States, 1955. 176 p. $2.

The Purposes of Higher Education, by Huston Smith. New York 16, Harper & Bros., 1955. 218 p. $3.50.

Reports the results of a study by a faculty committee of Washington University, over a period of 18 months, of the objectives of higher education to be used as a basis for a review of the liberal arts curriculum. The report is "an approximate answer" to what emerges when proponents of various philosophies, with a will to understand one another and a common concern for the future of education, consider "the aims of education which all can commend." Six chapters deal with the subjects of absolutism vs. relativism, objectivity vs. commitment, freedom vs. authority, egoism vs. altruism, the individual vs. the State, and sacred vs. secular, all with respect to their relations to education. Four other chapters apply this analysis to liberal education; they consider knowledge, abilities, appreciations, and motivations.

A Restudy of the Needs of California in Higher Education, prepared for the Liaison Committee of the Regents of the University of California and the California State Board of Education. Sacramento, Calif., California State Department of Education, 1955. 473 p.

The Teaching of Modern Languages. New York 27, Columbia University Press, 1955. Vol. X in the series *Problems in Education.* 297 p. $2.50.

A volume of studies deriving from the International Seminar organized by the Secretariat of UNESCO at Nuwara Eliya, Ceylon, in August 1953. The first six chapters correspond to the topics discussed at that seminar; the last six develop ancillary themes considered of special importance. Among the topics are the teaching of modern languages, audio-visual aids, textbooks, the training of modern language teachers, the use of radio and television in teaching modern languages, and special problems of language.

Vocational Interests 18 Years After College, by Edward K. Strong, Jr. Minneapolis 14, Minn., University of Minnesota Press, 1955. 207 p. $3.75.

Gives the results of an 18-year follow-up of the interest scores of former Stanford University students as compared with their present occupations. Additional data concerning many old problems are presented and a number of new developments outlined.

HIGHER EDUCATION

Published monthly from September through May. Its printing was approved by the Bureau of the Budget on September 28, 1954, as required by Rule 42 of the Joint Committee on Printing.

Publication Office: Office of Education U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE - - - WASHINGTON 25, D. C.

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